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EXAMINER

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: (1) the specification fails to provide proper antecedent basis for the recited shaker in claim 1; (2) the specification fails to provide proper antecedent basis for the recited power source in claim 36; and (3) the specification fails to provide proper antecedent basis for the recited contactor in claim 37.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-7, 21-23, 25-29, 31, 33, 36 and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 and its dependent claims 2-7 recite, "a shaker installed on the frame and **intermittently contacting** the shaking plate to shake the lever". This recitation appears to be inaccurate, in that Figs. 5, 7 and 8 of the instant application show a shaker (170) with a surface (170a) that **always** contacts a shaking plate 166. Rather, it is only the cam protrusions 170c on the cam surface (170a) of the cam gear (170) that appear to intermittently contact the shaking plate (166).

Claim 21 and its dependent claims 22-23, 25-29, 31 and 33 recite “a **motor**, selectively contacting the plate to rotate the lever shaft”. This recitation appears to be inaccurate, in that Figs. 5, 7 and 8 of the instant application do not show a motor selectively contacting a plate. Rather, these figures show a cam gear (170) with cam protrusions (170c) that selectively contact a plate (166), and show that the cam gear (170) is connected to a driving motor (172).

Claim 36 recites “a power source controlling the lever, by intermittently contacting the plate, to move with respect to the paper fed by the pickup roller to intermittently contact the paper”. This recitation appears to be inaccurate, in that Figs. 5, 7 and 8 of the instant application do not show a power source controlling a lever, by **intermittently** contacting a plate. Rather, these figures appear to show a cam gear (170) with cam protrusions (170c) that intermittently contact a plate (166) with the cam gear (170) having a driving motor (172) as a power source.

Claim 37 recites “a contactor installed on the printer and **intermittently** contacting the plate to rotate the shaft”. This recitation appears to be inaccurate, in that Figs. 5, 7 and 8 of the instant application show what appears to be a contactor (e.g., 170) that always contacts a plate (166).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 16-18, 20 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,674,736 (Tsubo).

Regarding claim 16, Figs. 3-7 disclose a method of preventing paper double feeding in a paper feeding unit of a printer when sheets of paper stacked on a paper cassette (including 36) are picked-up and transferred into the printer, the method comprising:

applying a first paper feeding resistance force (i.e., applying feeding resistance force via element 98) to a first sheet of paper which is picked-up by a pickup roller (58 or 60) and transferred along a paper path into the printer, and

intermittently applying a second paper feeding resistance force (i.e., applying second paper feeding resistance force via element 46) to a side of one of the first sheet of paper or a second sheet of paper disposed under the first sheet of paper,

wherein the second paper feeding resistance force includes a friction force intermittently applied to the side of the second sheet of paper (i.e., sheet below top sheet in Figs. 3-7) by a lever (including 46) which is installed to be shaken on the paper path.

Regarding claim 17, Figs. 3-7 show that the applying of the first paper feeding resistance force comprises:

applying a resistance generated by a stripper (98) which is installed to be inclined at a predetermined angle on the paper path.

Regarding claim 18, the first paper feeding resistance force (i.e., feeding resistance force via element 98) is inherently smaller than a first paper feeding force

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applied to the first sheet of paper by the pickup roller (58 or 60) and is larger than a paper feeding force applied to the second sheet of paper due to a friction force between the first and second sheets of paper. This condition is needed to move the sheets along with the roller (58 or 60), but also separate the sheets.

Regarding claim 20, as best understood, using element 46 to provide the second paper feeding resistance force will result in the second feeding resistance force being larger than the first paper feeding resistance force, as claimed.

Regarding claim 32, Figs. 3-7 show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller (58 or 60) which picks up paper stacked on a paper cassette (36) and transfers the paper into the printer, and a plurality of paper guides (62 and 56) which are installed at a portion of the paper cassette (including 36) and guide the paper transferred by the pickup roller (58 or 60) in a paper feeding path, the apparatus comprising:

a stripper (98) disposed on the paper feeding path, fixedly installed on the frame to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (including 36), and contacting the paper transferred by the pickup roller (58 or 60) to apply a first paper feeding resistance force to the paper;

a lever (46) disposed on the paper feeding path, movably installed on the frame, and having a contact surface contacting the paper transferred by the pickup roller to apply a second paper feeding resistance force to the paper; and

a lever shaking unit (including 110) mounted on the frame to shake the lever to intermittently contact the paper transferred by the pickup roller (58 or 60),

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wherein the shaking unit comprises:

a resilient member (104) biasing the lever (46) in a first direction,

a motor (86) moving the lever (46) in a second direction to selectively allow the contact surface to contact the paper (see Figs. 6 and 7),

a shaft (102) connected to the lever (46),

a shaking plate (100) connected to the shaft (102), and

a cam (110) connected to the motor (86) to contact the shaking plate.

Regarding the plurality of paper guides (62 and 56) which are installed at a portion of the paper cassette (including 36), it is noted that the dictionary defines the term "at" as "To or toward the direction of". See Webster's II New Riverside University Dictionary (1984), at page 134. It is the examiner's position that the guides (62 and 56) are installed to or toward the direction of a portion of the paper cassette (including 36), as claimed.

4. Claims 16-18, 20-23, 25-26, 29 and 36-37, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,382,621 (Innoue et al.).

Regarding claim 16, Figs. 1, 2, 11 and 12 disclose a method of preventing paper double feeding in a paper feeding unit of a printer when sheets of paper stacked on a paper cassette (1) are picked-up and transferred into the printer, the method comprising:

applying a first paper feeding resistance force (i.e., applying feeding resistance force via element 41) to a first sheet of paper which is picked-up by a pickup roller (2) and transferred along a paper path into the printer, and

intermittently applying a second paper feeding resistance force (i.e., applying second paper feeding resistance force of lever 8) to a side of one of the first sheet of paper and a second sheet of paper disposed under the first sheet of paper,

wherein the second paper feeding resistance force includes a friction force intermittently applied to the side of the second sheet of paper (i.e., sheet below top sheet in Figs. 11-12) by a lever (8) which is installed to be shaken on the paper path.

Regarding claim 17, Figs. 1, 2, 11 and 12 show that the applying of the first paper feeding resistance force comprises:

applying a resistance generated by a stripper (41) which is installed to be inclined at a predetermined angle on the paper path.

Regarding claim 18, the first paper feeding resistance force (i.e., feeding resistance force via element 41) is inherently smaller than a first paper feeding force applied to the first sheet of paper by the pickup roller (2) and is larger than a paper feeding force applied to the second sheet of paper due to a friction force between the first and second sheets of paper. This condition is needed to move the sheets along with the roller (2), but also separate the sheets.

Regarding claim 20, using element 41 to provide the second paper feeding resistance force will result in the second feeding resistance force being larger than the first paper feeding resistance force, as claimed.

Regarding claim 21, Figs. 1-2 and 11-12 show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig.1), a pickup roller (2) which picks up paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Fig. 2) which are installed at a portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2) in a paper feeding path, the apparatus comprising:

- a stripper (41 in Fig. 12) disposed on the paper feeding path, fixedly installed on the frame to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (1), and contacting the paper transferred by the pickup roller (2) to apply a first paper feeding resistance force to the paper;

- a lever shaking unit, comprising

- a lever shaft (9) movably installed on the frame,

- a plate (8a) extending from the lever shaft (9), and

- a motor (column 5, lines 16-18), selectively contacting the plate (8a) to rotate the lever shaft (9), and

- a lever (8) disposed on the paper feeding path, installed on the shaft (9), and having a contact surface intermittently contacting the paper transferred by the pickup roller (2) to apply a second paper feeding resistance force to the paper.

Regarding claim 22, as best understood, Figs. 4, 11 and 12 show that the paper comprises a first paper (top sheet) and a second paper (below top sheet), and the stripper (41) applies the first paper feeding resistance force to the first paper (top sheet) while the contacting surface of the lever (8) applies the second paper feeding resistance

force to the second paper. The position of the stripper is shown in Figs. 11-12 and the timing of operation appears to be shown in Fig. 4.

Regarding claim 23, Figs. 4 and 11-12 show that the lever (8) selectively contacts the paper while the stripper contacts the paper.

Regarding claim 25, Figs. 11-12 show that the lever (8) moves in a direction between a first position (Fig. 11) to allow the contact surface to contact the paper and a second position (Fig. 12) to allow the contact surface to be moved away from the paper passing the stripper.

Regarding claim 26, Figs. 1-2 and 11-12 show that the lever (8) rotates in a direction (up and down) perpendicular to the paper feeding direction.

Regarding claim 29, Figs. 1-2 and 11-12 show that the paper comprises a first paper (top sheet) and a second paper (below top sheet), the first paper and the second paper generate a friction force between the first paper and the second paper, and the second paper feeding resistance force is equal to or greater than the friction force.

Regarding claim 36, Figs. 1-2 and 11-12 show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Fig. 2) which are installed at a portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2) in a paper feeding path, the apparatus comprising:

a stripper (41 in Fig. 12) fixedly disposed on the paper feeding path to apply a first paper feeding resistance force to the paper fed by the pickup roller (2),

a lever (8) movably disposed on the paper feeding path to selectively apply a second paper feeding resistance force to the paper fed by the pickup roller (2), the lever (8) being installed on a lever shaft (9) rotatably installed on the frame;

a plate (8a) extending from the lever shaft (9), and

a power source (column 5, lines 16-18) controlling the lever (8), by intermittently contacting the plate (8a), to move with respect to the paper fed by the pickup roller (2) to intermittently contact the paper.

Regarding claim 37, Figs. 1-2 and 11-12 show an apparatus for picking up sheets of paper in a printer, including

a pickup roller (2) installed in the printer;

an intermittent force applying unit, comprising

a shaft (9) installed on the printer,

a plate (8a) extending from the shaft (9), and

a contactor (10) installed on the printer and intermittently contacting the plate (8a) to rotate the shaft (9), and

a lever (8) installed on the shaft (9) and intermittently applying a friction force, under influence of the intermittent force applying unit, to a rear side of a sheet of the picked up paper, to prevent double feeding of the paper. It is noted that the recited "rear side of a sheet of paper" can be any one of the different sides of the sheet of paper.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 4, 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Inoue et al.).

Regarding claim 1, Figs. 1-5 and 11-12 show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up sheets of paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Figs. 1-2) which are installed at a front portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2), the apparatus comprising:

a stripper (41) which is installed to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (1),

a lever (8) which is installed at a side of the stripper (41) and has a contact surface contacting the paper transferred by the pickup roller (2), and

a lever shaking unit which shakes the lever (8) to intermittently contact a side of the paper transferred by the pickup roller (2), the lever shaking unit comprising

a lever shaft (9) installed on the frame, the lever (8) being connected to the lever shaft (9),

a shaking plate (8a) extending from the lever shaft (9), and

a shaker (10) installed on the frame and intermittently contacting the shaking plate (8a) to shake the lever (8);

wherein a friction force is intermittently applied to the side of the paper such that double feeding of the paper is prevented.

Also, Fig. 12 of Innoue et al. shows that the stripper (41) is attached to a front side of at least one of the guides (11), but does not specifically show that such stripper is attached to at least one front side of each of the paper guides (11). However, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to provide the same stripper on the front sides of both guides (11)(see Fig. 2)) so as to avoid the possibility of skewed feeding of sheets due to a difference in friction applied to different portions of the sheets by the two different guides (11).

Regarding claim 5, the friction force intermittently applied to the side of the paper by the lever (8) is inherently larger than a resistance applied to the paper by the stripper (41), so that the paper can be fed past the stripper (41) but moved by the outer surface of the lever (8).

For claim 4, different elements of the Innoue et al. patent are relied upon to disclose the claimed lever and the claimed paper cassette. Thus, all of the limitations of claim 1 and claim 4 with these different elements are included in the rejection below.

Regarding claim 4, Figs. 1-2 and 8-10 show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up sheets of paper stacked on a paper cassette (31) and transfers the paper into the printer, and a plurality of paper guides (38) which are installed at a front

portion of the paper cassette (31) and guide the paper transferred by the pickup roller (2), the apparatus comprising:

- a lever (37) that has a contact surface contacting the paper transferred by the pickup roller (2), and

- a lever shaking unit which shakes the lever (37) to intermittently contact a side of the paper transferred by the pickup roller (2), the lever shaking unit comprising

- a lever shaft (41) installed on the frame, the lever (37) being connected to the lever shaft (41),

- a shaking plate (connected to 37, but not numbered) extending from the lever shaft (41), and

- a shaker (10) installed on the frame and intermittently contacting the shaking plate to shake the lever;

wherein a friction force is intermittently applied to the side of the paper such that double feeding of the paper is prevented.

Also, Fig. 8 of Innoue et al. shows that the lever (47) has a plurality of sub-levers. Moreover, Fig. 12 of Innoue et al. shows that it is well known to provide a stripper (41) on a face of at least one paper guide, but does not specifically show that such stripper is attached to at least one front side of each of the paper guides. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to provide the same stripper on the front sides of both guides, so as to avoid the possibility of skewed feeding of sheets due to a difference in friction applied to different portions of the sheets by the two different guides. Providing one stripper portion on each of the

guides (47) would result in the stripper (41) being installed at a side of the lever and having the same number of sub-strippers (i.e., 2 sub-strippers) has the number of sub-levers (i.e., 2 sub-levers).

Regarding claim 8, Figs. 1-2 and 11-12 of Innoue et al. show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up sheets of paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Fig. 2) which are installed at a front portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2), the apparatus comprising:

- a stripper (41 in Fig. 12) which is installed to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (1);

- a lever (8) which is installed at a side of the stripper (41) and has a contact surface to contact the paper transferred by the pickup roller (2);

- a lever shaking unit which shakes the lever (8) to intermittently contact a side of the paper transferred by the pickup roller (2); and

- a lever shaft (9) which is placed at the side of the stripper (41) and rotatably installed on the frame of the printer, wherein the lever (8) is fixed on the lever shaft (9), and the lever shaking unit shakes the lever shaft (9) so that the lever (8) is shaken. The cam member (10) shakes the lever (8) as well as the shaft (9).

Also, a friction force is intermittently applied to the side of the paper by the lever (8), such that double feeding of the paper is prevented.

Moreover, Fig. 12 of Innoue et al. shows that it is well known to provide a stripper (41) on a face of at least one paper guide (11), but does not specifically show that such stripper is attached to at least one front side of each of the paper guides (11). However, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to provide the same stripper on the front sides of both guides (11), so as to avoid the possibility of skewed feeding of sheets due to a difference in friction applied to different portions of the sheets by the two different guides.

6. Claim 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Innoue et al.) as applied to claim 1 above, and further in view of U.S. Patent No. 5,443,251 (Kan et al.). The Innoue et al. patent discloses a lever, but does not specifically show that the lever has a rubber friction pad, as set forth in claims 6 and 7..

Figs. 27-29 of the Kan et al. patent show that it is well known to provide a friction pad (57) made from rubber material on a cam operated lever (57b) to prevent double feeding of sheets. See column 20, lines 51-54. It would have been obvious to one of ordinary skill in the art at the time of the invention, to provide the contact surface of Innoue et al. with a friction pad formed of a rubber material, to prevent double feeding of sheets, as taught by Kan et al. See also column 14, lines 5-11 of Kan et al.

7. Claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Innoue et al.) in view of U.S. Patent No. 5,443,251 (Kan et al.).

Regarding claim 9, Figs. 1-2 and 11-12 of Innoue et al. show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up sheets of paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Fig. 2) which are installed at a front portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2), the apparatus comprising:

- a stripper (41 in Fig. 12) which is installed to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (1),

- a lever (8) which is installed at a side of the stripper (41) and has a contact surface to contact the paper transferred by the pickup roller (2),

- a lever shaking unit which shakes the lever (8) to intermittently contact a side of the paper transferred by the pickup roller (2); and

- a lever shaft (9) which is placed at the side of the stripper (41) and rotatably installed on the frame of the printer, wherein the lever (8) is fixed on the lever shaft (9), and the lever shaking unit shakes the lever shaft (9) so that the lever (8) is shaken. The cam member (10) shakes the lever (8) as well as the shaft (9).

Also, a friction force is intermittently applied to the side of the paper by the lever (8), such that double feeding of the paper is prevented, and the lever shaking unit comprises:

- a shaking plate (8a) fixed on a lever shaft (9),

a cam gear (10) which contacts a first side of the shaking plate (8a), rotates, and periodically shakes the shaking plate (8a) so that the lever (8) coupled with the lever shaft (9) is shaken, and

a driving motor (column 5, lines 16-18) which rotates and drives the cam gear (10).

Moreover, Fig. 12 of Innoue et al. shows that it is well known to provide a stripper (41) on a face of at least one paper guide (11), but does not specifically show that such stripper is attached to at least one front side of each of the paper guides (11). However, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to provide the same stripper on the front sides of both guides (11), so as to avoid the possibility of skewed feeding of sheets due to a difference in friction applied to different portions of the sheets by the two different guides.

The Innoue et al. patent does not show an elastic member, as claimed.

Figs. 27-29 of the Kan et al. patent show that it is well known to provide an elastic member (215) that biases a lever (57) in a first direction (i.e., biased into contact with a cam). The Kan et al. patent explains that element 57 is always pressed against the cam 213 by a bias spring 215. Accordingly, element 57 can be pivoted by the cam against the bias force of the spring. It would have been obvious to one of ordinary skill in the art at the time of the invention, to provide the lever (8) of Innoue et al. with an elastic member to bias the lever (8) toward the cam (10) of Innoue and ensure that the lever follows the cam surface of the cam, as shown in Kan et al. See also column 20, lines 11-17 of Kan et al.

Regarding claim 13, the cam gear (10) of Innoue et al. comprises a cam surface; and the lever shaking unit comprises at least one cam protrusion formed on the cam surface that contacts the shaking plate (8a).

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Innoue et al. in view of Kan et al. as applied to claim 9 above, and further in view of U.S. Patent Publication No. 2003/0132570. Innoue et al. and Kan et al. disclose all of the limitations of claim 10, except for the driving motor rotating and driving the pickup roller as well as the cam gear.

U.S. Patent Publication No. 2003/0132570 discloses that it is well known to use the same motor to drive all of the mechanisms in a paper feeding device. See, e.g., numbered paragraph [0038]. Such use of a single motor reduces the number of parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a single motor to drive the pickup roller and the cam gear in order to reduce the number of parts. See, e.g., numbered paragraph [0038] of U.S. Patent Publication No. 2003/0132570.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Innoue et al.)(hereinafter "Innoue '621") in view of Kan et al. as applied to claim 9 above, and further in view of U.S. Patent No. 6,000,689 (Innoue et al.)(hereinafter "Innoue '689"). The Innoue '621 and Kan et al. patents disclose the claimed invention except for a compression coil spring.

Fig. 3 of Innoue '689 shows that it is well known to use a compression coil spring (11) to bias a lever (7) in the direction of a cam member (8). These two elements were

art recognized equivalents at the time of the invention in those lever moving applications where it is immaterial whether a compression coil spring or a tension spring is used for biasing a lever. Therefore, one of ordinary skill would have found it obvious to substitute a compression coil spring for the tension spring of Kan et al to facilitate biasing of the lever as suggested by Fig. 3 of Innoue '689. One of ordinary skill in the art would have been motivated to use a compression coil spring rather than a tension spring to simplify assembly, by eliminating the step of connecting a small end portion of the tension spring into a small hole in a lever portion, as shown in Fig. 28A of Kan et al.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Innoue et al. in view of Kan et al. as applied to claim 9 above, and further in view of U.S. Patent No. 5,485,991 (Hirano et al.). Innoue et al. in view of Kan et al. meets the limitations of the claim except that it employs a tension spring rather than a leaf spring in order to hold the shaking plate against the cam. Fig. 20 of the Hirano et al. patent discloses that it is well known to bias a movable member (13) into contact with a cam (10) using a leaf spring (12). More specifically, the Hirano patent shows that these two elements were art recognized equivalents at the time of the invention in those shaking applications where it is immaterial whether a leaf spring or a tension spring is used for holding a shaking plate against a cam. Therefore, one of ordinary skill would have found it obvious to substitute a leaf spring for the tension spring of Kan et al. to facilitate holding of the shaking plate against the cam as suggested by Fig. 20 of the Hirano et al. patent. One of ordinary skill in the art would have been motivated to use a leaf spring rather than a tension spring to simplify assembly, by eliminating the step of connecting a

small end portion of the tension spring into a small hole in a lever portion, as shown in Fig. 28A of Kan et al.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Innoue et al.) in view of U.S. Patent No. 4,349,126 (Brown). Regarding claim 15, Figs. 1-2 and 11-12 of Innoue et al. show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up sheets of paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Fig. 2) which are installed at a front portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2), the apparatus comprising:

- a stripper (41 in Fig. 12) which is installed to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (1),

- a lever (8) which is installed at a side of the stripper (41) and has a contact surface to contact the paper transferred by the pickup roller (2),

- a lever shaking unit which shakes the lever (8) to intermittently contact a side of the paper transferred by the pickup roller (2); and

- a lever shaft (9) which is placed at the side of the stripper and rotatably installed on the frame of the printer, wherein the lever (8) is fixed on the lever shaft (9), and the lever shaking unit shakes the lever shaft (9) so that the lever is shaken. The cam member (10) shakes the lever as well as the lever shaft.

Also, a friction force is intermittently applied to the side of the paper by the lever (8), such that double feeding of the paper is prevented, and the lever shaking unit comprises:

a shaking plate (8a) fixed on the lever shaft (9). The Innoue et al. patent also provides a broad teaching of a rotation control mechanism (column 5, lines 16-18) coupled such that the lever shakes, but Innoue et al. does not specifically disclose that such rotation control mechanism is a solenoid.

The Brown patent discloses that it is well known to use a solenoid (74) to rotate a cam (76), which then drives a lever. In other words, Brown shows that these two elements were art recognized equivalents at the time of the invention in those shaking applications where it is immaterial whether a motor or a solenoid is used for shaking a lever. Therefore, one of ordinary skill would have found it obvious to substitute a solenoid for the rotation control mechanism of Innoue et al. to facilitate shaking of a lever as suggested by Brown at Fig. 2 and column 4, lines 52-54. One of ordinary skill in the art would have been motivated to provide a solenoid as the rotation control mechanism, because it is a simple device that does not require a lot of gearing mechanisms. See, e.g., Fig. 2 of Brown.

12. Claim 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Innoue et al.) as applied to claim 21 above, and further in view of U.S. Patent No. 5,443,251 (Kan et al.). The Innoue et al. patent discloses all of the elements of claims 31 and 33, except for the resilient member, as claimed. Figs. 27-29 of the Kan et al. patent show that it is well known to

provide a resilient member (215) that biases a lever (57) in a first direction (i.e., biased into contact with a cam). The Kan et al. patent explains that element 57 is always pressed against the cam 213 by a bias spring 215. Accordingly, element 57 can be pivoted by the cam against the bias force of the spring. It would have been obvious to one of ordinary skill in the art at the time of the invention, to provide the lever (8) of Innoue et al. with a resilient member to bias the lever (8) toward the cam (10) of Innoue and ensure that the lever follows the cam surface of the cam, as shown in Kan et al. See also column 20, lines 11-17 of Kan et al.

Regarding claim 33, the shaft (9) of Innoue et al. is parallel to a width direction of the paper perpendicular to the paper feeding direction.

13. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Innoue et al.) in view of U.S. Patent No. 5,443,251 (Kan et al.). For claim 32, Figs. 1-2 and 9-12 of Innoue et al. show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Fig. 2) which are installed at a portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2) in a paper feeding path, the apparatus comprising:

a stripper (41) disposed on the paper feeding path, fixedly installed on the frame to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (1), and contacting the paper transferred by the pickup roller (2) to apply a first paper feeding resistance force to the paper;

a lever (8) disposed on the paper feeding path, movably installed on the frame, and having a contact surface contacting the paper transferred by the pickup roller (2) to apply a second paper feeding resistance force to the paper; and

a lever shaking unit mounted on the frame to shake the lever (8) to intermittently contact the paper transferred by the pickup roller (2),

wherein the shaking unit comprises:

a motor (column 5, lines 16-18) moving the lever (8) in a second direction to selectively allow the contact surface to contact the paper,

a shaft (9) connected to the lever (8),

a shaking plate (8a) connected to the shaft (9), and

a cam (10) connected to the motor (column 5, lines 16-18) to contact the shaking plate.

The Innoue et al. patent discloses all of the limitations of claim 32, except for the resilient member, as claimed.

Figs. 27-29 of the Kan et al. patent show that it is well known to provide a biasing member (215) that biases a lever (57) in a first direction (i.e., biased into contact with a cam). The Kan et al. patent explains that element 57 is always pressed against the cam 213 by a bias spring 215. Accordingly, element 57 can be pivoted by the cam against the bias force of the spring. It would have been obvious to one of ordinary skill in the art at the time of the invention, to provide the lever (8) of Innoue et al. with a resilient member to bias the lever (8) toward the cam (10) of Innoue and ensure that the lever

follows the cam surface of the cam, as shown in Kan et al. See also column 20, lines 11-17 of Kan et al.

14. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,382,621 (Innoue et al.) in view of U.S. Patent Publication No. 2003/0132570. Regarding claim 35, Figs. 1-2 and 11-12 of Innoue et al. show an apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame (Fig. 1), a pickup roller (2) which picks up paper stacked on a paper cassette (1) and transfers the paper into the printer, and a plurality of paper guides (11 in Fig. 2) which are installed at a portion of the paper cassette (1) and guide the paper transferred by the pickup roller (2) in a paper feeding path, the apparatus comprising:

a stripper (41 in Fig. 12) disposed on the paper feeding path, fixedly installed on the frame to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette (1), and contacting the paper transferred by the pickup roller (2) to apply a first paper feeding resistance force to the paper;

a lever (8) disposed on the paper feeding path, movably installed on the frame, and having a contact surface contacting the paper transferred by the pickup roller (2) to apply a second paper feeding resistance force to the paper.

Also, the Innoue et al. patent discloses a motor (column 5, lines 16-18), but does not specifically disclose that such motor rotates the pickup roller (2) and moves the lever (8) with respect to the stripper (41).

However, U.S. Patent Publication No. 2003/0132570 discloses that it is well known to use the same motor to drive all of the mechanisms in a paper feeding device.

See, e.g., numbered paragraph [0038]. Such use of a single motor reduces the number of parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a single motor to drive the pickup roller and the cam gear in order to reduce the number of parts. See, e.g., numbered paragraph [0038] of U.S. Patent Publication No. 2003/0132570.

Response to Arguments

15. Applicants arguments with respect to claims 1-18, 20-23, 25-29, 31-33 and 35-37 have been fully considered, but are moot in view of the new grounds of rejection.

Allowable Subject Matter

16. Claims 2-3 and 27-28 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

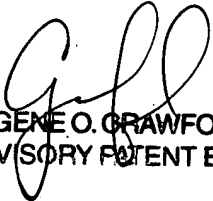
Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Morrison whose telephone number is (571) 272-7221. The examiner can normally be reached on M-F, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene Crawford can be reached on (571) 272-6911. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

05/23/2006


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